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Taxonomic Study on the Family Pseudocaeciliidae
(Psocoptera: Psocomorpha) of Japan
1. Revision of the Genus *Pseudocaecilius*^{1), 2), 3)}

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Abstract The genus *Pseudocaecilius* of Japan is revised. Three species, *P. citricola*, *P. kagoshimensis* and *P. maculosus* are redescribed and a new subspecies, *P. kagoshimensis yaeyamensis*, is described. Male and female genitalia are illustrated for each taxon, as far as the materials are available. Generic diagnostic characters and a key to Japanese species and subspecies are provided. This paper is the first part of the study of the Japanese Pseudocaeciliidae.

Key words: *Pseudocaecilius*; Pseudocaeciliidae; Psocoptera; taxonomy; Japan.

The family Pseudocaeciliidae PEARMAN, 1936, includes about 180 species classified into 19 genera in the world. This family is distributed mainly in the tropics and abundant in the Oriental and Pacific Regions. LEE and THORNTON (1967) revised the Oriental and Pacific species of the family and recorded 47 species belonging to 8 genera from these regions. Since then, many studies involved in the Pseudocaeciliidae of these regions were published as mentioned by LEE and NEW (1992), and about 100 species classified into 10 genera have been known until now. On the other hand, only a few species of the family are known from the Palaearctic Region.

In the morphological respect, the family is considered as one of the most primitive families in the Psocomorpha (SMITHERS, 1972), and characterized by the bicuspid lacinia, abundant hairs on the head and thorax, two rows of setae on the forewing veins, crossing setae of apical margin of the fore- and hindwings, a pair of posterior processes of the hypandrium and the bilobed female subgenital plate. However, it is difficult to distinguish Pseudocaeciliidae from similar families without examination of genitalic characters which are also very important taxonomically in specific level. Nevertheless, in early studies, the venation of forewing was mainly used for a taxonomic character of each taxon and genitalic

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structures were rarely described. Therefore, much confusion and many inadequate classifications were caused by it.

The Japanese Pseudocaeciliidae were first studied by ENDERLEIN (1907) who described two new species, *Pseudocaecilius maculosus* and *P. solocipennis* from Kanagawa Prefecture, Honshu, treating only external structures. Then LEE and THORNTON (1967) recorded *P. elutus* ENDERLEIN, 1903, a synonym of *P. citricola* (ASHMEAD, 1879), from the Bonin Islands. They also mentioned that *Kolbea kagoshimensis* OKAMOTO, 1910, having been placed in the family Amphisocidae, is possibly referable to *Pseudocaecilius* or its allies. In addition, three undetermined species were recorded from Japan, *Pseudocaecilius* sp. from Amami-Ōshima Island by TSUTSUMI (1964) and *Heterocaecilius* sp. from Yakushima Island and *Ophioperma* sp. from Honshu by TOMITA and HAGA (1991). They also gave a key to Japanese species of Pseudocaeciliidae including the two undetermined ones mentioned above. Thus, the named species of Japanese Pseudocaeciliidae are three.

This paper is the first part of a revisional study of the Japanese Pseudocaeciliidae, and deals with the genus *Pseudocaecilius*.

The genus *Pseudocaecilius* ENDERLEIN, 1903, is regarded as one of the most specialized genera in the family (SMITHERS, 1972), and characterized by the long Rs and flattened areola postica of forewing, simplified phallosome, unlobed and fringed dorsal and ventral valves of gonapophyses and single seta at each lobe of subgenital plate. The genus includes about 40 species and is widely distributed around the tropical areas of the world. About three-fourths of them are distributed in the Oriental and Pacific Regions and only two species occur in the Palearctic Region. All the three named Japanese species of the family have been placed in this genus.

In the present paper, the following three known species of the genus *Pseudocaecilius* are redescribed and one new subspecies is described from Japan: *P. citricola* (ASHMEAD) and *P. maculosus* ENDERLEIN are redescribed; *P. kagoshimensis* (OKAMOTO) is transferred from *Kolbea* and the species and the nominotypical subspecies are redescribed, and a new subspecies, *P. kagoshimensis yaeyamensis*, is described from the Yaeyama Group. The male and female genitalia are illustrated, as far as the materials are available. *P. solocipennis* ENDERLEIN is not treated in this part because the species is not considered as a member of this genus, that will be mentioned in the next part of the present study.

Most species of this genus inhabit many kinds of living foliage as noted by SMITHERS (1972), TURNER (1973) and others. Most specimens used in this study were also collected by beating of living foliage.

Materials and Methods

The specimens used in this study were fixed with 80% ethanol and preserved in 65% glycerol. In the observation of the genitalia, the terminal segments of abdomen were placed in 5% solution of KOH for about 24 hours. After the treatment, the materials were washed with distilled water and put into pure

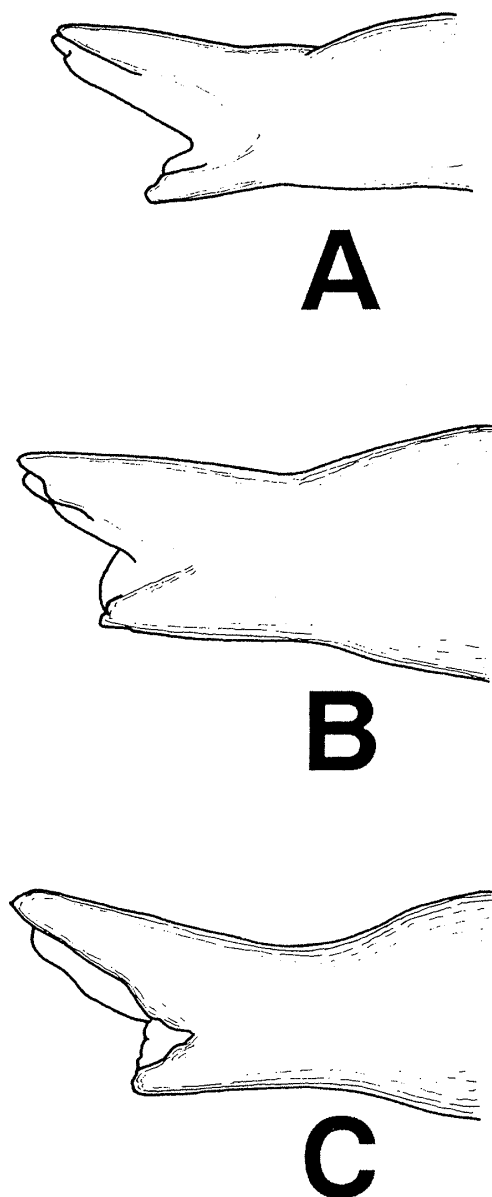


Fig. 1. Apices of laciniae of Japanese *Pseudocaecilius* species., anterior aspect. A, *P. citricola*; B, *P. kagoshimensis kagoshimensis*; C, *P. maculosus*. Scale: 0.025 mm.

glycerol, and dissected and observed under a binocular stereoscopic microscope and a light microscope. Right forewing was mounted on a slide with balsam.

Measurements are given in millimeters and made of body length (B), fore and hindwing lengths (Fw, Hw), lengths of first and second flagellar segments (f1, f2), lengths of hind femur, tibia and 1st and 2nd tarsomeres (Hf, Ht, t1, t2). The ratio between intraocular space and eye-diameter (IO:D) is calculated as seen from the front of head.

Depositories of the specimens examined are abbreviated in the text as follows: ELKU: Entomological Laboratory, Faculty of Agriculture, Kyushu University; NIAES: National Institute of Agro-Environmental Sciences, Tsukuba, Ibaraki; SEHU: Systematic Entomology, Faculty of Agriculture, Hokkaido University; YC: YOSHIZAWA collection.

New distributional record is shown with an asterisk after the name of region.

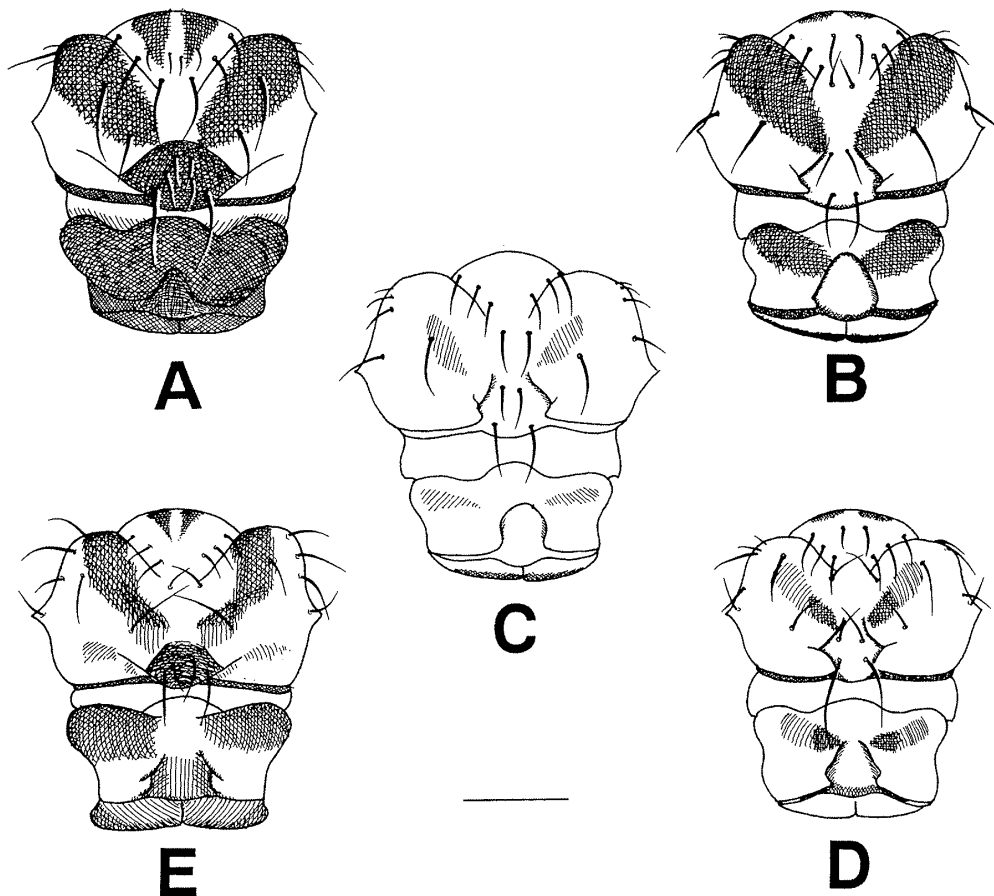


Fig. 2. Meso- and metanotum of Japanese *Pseudocaecilius* species., dorsal aspect. A, *P. citricola*; B, *P. kagoshimensis kagoshimensis*, male; C, ditto, female; D, *P. k. yae-yamensis* subsp. nov. female; E, *P. maculosus*. Scale: 0.2 mm.

Genus *Pseudocaecilius* ENDERLEIN, 1903

Type species: *Pseudocaecilius elutus* ENDERLEIN, 1903 (a junior synonym of *Psocus citricola* ASHMEAD, 1879).

Pseudocaecilius ENDERLEIN, 1903, Ann. Mus. natn. Hung., **1**: 260; PEARMAN, 1936, Proc. R. ent. Soc. Lond. (B), **53**: 60; ROESLER, 1944, Stett. ent. Ztg., **105**: 152; LEE et THORNTON, 1967, Pacific Ins. Monog., **16**: 9.

Hageniella ENDERLEIN, 1903, Ann. Mus. natn. Hung., **1**: 258 (type species: *Epipsocus zonatus* ENDERLEIN, 1903); PEARMAN, 1936, Proc. R. ent. Soc. Lond., (B), **53**: 60.

Body yellowish white, with brown markings on head and thorax. Forewing hyaline, with some obscure markings; venation as in *Caecilius*; Rs long, as long as or longer than R_{4+5} ; areola postica elongate, usually flattened; veins provided with two rows of setae. Claws without preapical tooth. Phallosome simple;

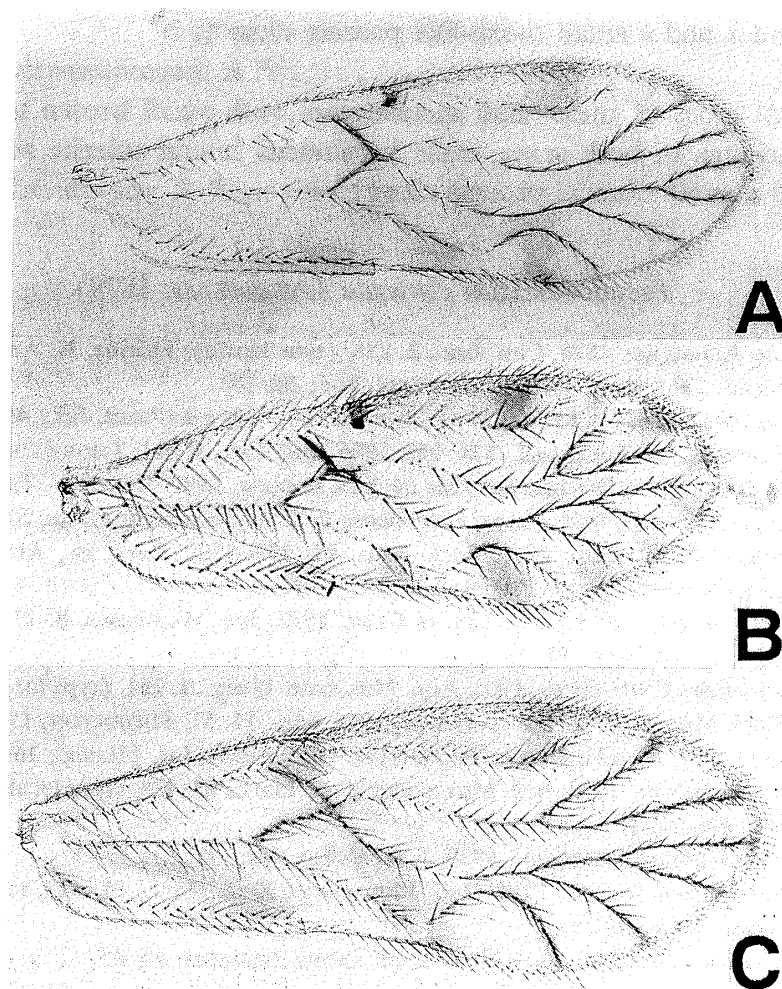


Fig. 3. Forewings of Japanese *Pseudocaecilius* species. A, *P. citricola*; B, *P. kagoshimensis kagoshimensis*; C, *P. maculosus*.

endophallus without any sclerotized portions; hypandrium with a lateral pair of sclerites. Female gonapophyses complete; dorsal and ventral valves without lobes; external valve tapered apically; subgenital plate bilobed, each lobe with an apical seta.

Key to the Japanese Species of *Pseudocaecilius*

1. Areola postica relatively flattened 2
- Areola postica nearly semi-circular *P. maculosus* ENDERLEIN
2. Forewing with a brown marking in each cell at wing margin between pterostigma and areola postica *P. kagoshimensis* (OKAMOTO)... 3
- Forewing without such markings *P. citricola* (ASHMEAD)
3. Lateral lobes of meso- and metascutum with large brown markings in male, usually with faint markings in female; male hypandrial lateral sclerite slender and a small thorn-like process close to it
..... *P. k. kagoshimensis* (OKAMOTO)
- Lateral lobes of meso- and metascutum with small brown to light brown markings in both sexes; male hypandrial lateral sclerite somewhat bold and a small conical process close to it *P. k. yaeyamensis* subsp. nov.

Pseudocaecilius citricola (ASHMEAD, 1879)

Psocus citricola ASHMEAD, 1879, Can. Ent., 2: 228, (type locality: Florida, N. America).

Caecilius citricola: CHAPMAN, 1930, J. N. Y. ent. Soc., 38: 331.

Pseudocaecilius citricola: MOCKFORD et GURNEY, 1956, J. Wash. Acad. Sci., 46: 364; TURNER, 1975, Trans. R. ent. Soc. Lond., 126: 580; 1976, Syst. Ent., 1: 211; THORNTON, 1984, Treubia, 29: 130; NEW, 1993, Oriental Ins., 15: 34; LEE et NEW, 1992, Invertebr. Taxon., 6: 1093.

Elipsocus criniger PERKINS, 1899, Fauna Hawaiiensis 2: 85, (type locality: Kona, 2000 feet, Hawaii).

Kilauella criniger: ENDERLEIN, 1913, Zool. Anz., 41: 357; 1920, Zool. Jb., Abt. Syst., 43: 456; ZIMMERMAN, 1948, Insect of Hawaii, 2: 239.

Pseudocaecilius criniger: THORNTON, LEE et CHUI, 1972, Ins. Micronesia, 8: 112; THORNTON et WOO, 1973, Pacific Ins., 15: 34.

Pseudocaecilius elutus ENDERLEIN, 1903, Ann. Mus. natn. Hung., 1: 261, (type locality: Singapore); 1926, Zool. Meded., 9: 58; SOEHARDJAN, 1958, Idea, 11: 31; THORNTON, 1961, Proc. R. ent. Soc. Lond. (B), 30: 141; LEE et THORNTON, 1967, Pacific Ins. Monog., 16: 83.

Caecilius pretiosus BANKS, 1920, Bull. Mus. comp. Zool. Harv., 65: 423, (type locality: San Antonio, Texas, N. America).

Pseudocaecilius pretiosus: CHAPMAN, 1930, J. N. Y. ent. Soc., 38: 331.

Pseudocaecilius wolcottii BANKS, 1924, Bull. Mus. comp. Zool. Harv., 65: 423, (type locality: San Juan, Texas, N. America).

Ttichopsocus indicatus NAVAS, 1934, Rev. Acad. Cienc. Zaragoza, 11: 45.

Female. Coloration: Head yellow with a slight reddish tinge, with X-shaped pale portion on head; frons and median area of vertex brownish; eye

black, often with purplish tinge; ocelli pale brown. Antenna pale brown; scape and pedicel darker. Mouth parts pale yellowish white; molar and teeth areas of mandible brown; maxillary palpus pale brown. Thorax (Fig. 2A) pale yellow, with purplish brown irregular lateral stripes, which continue to dark areas of posterior part of orbit anteriorly and of 1st abdominal segment posteriorly; lateral lobe of mesoscutum with a dark brown marking; anterior lobe of mesoscutum with a pair of dark brown markings; mesoscutellum and metanotum brown. Legs pale yellowish white; fore tibia pale brown; 2nd tarsomere gray; claws black. Forewing (Fig. 3A) hyaline, with brown markings on apical 2/5 of pterostigma except for extreme tip, median area of areola postica and distal edge of cells cu_1 and cu_2 ; veins dark brown except basal half of Rs and M, entire R, R_1 and CuA. Hindwing hyaline; veins pale except apical half of Rs, entire R_{4+5} , M

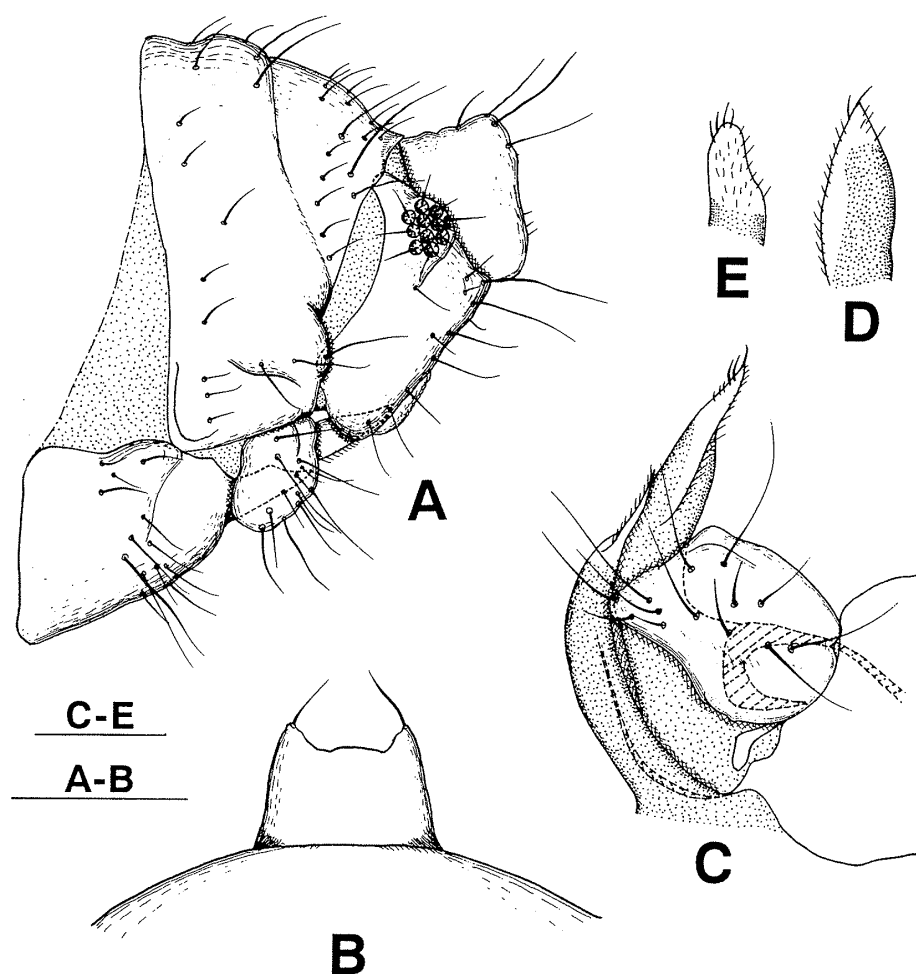


Fig. 4. Female genitalia of *Pseudocaecilius citricola*. A, terminalia, lateral aspect; B, subgenital plate, ventral aspect; C, gonapophyses, ventral aspect; D, apex of dorsal valve, lateral aspect; E, apex of ventral valve, lateral aspect. Scale: 0.2 mm for A, 0.1 mm for B, 0.1 mm for C-E.

and CuA pale brown. Abdomen yellowish white; genital segments pale brown, dorsal area of 9th abdominal tergum dark brown.

Structure: Eye ratio $IO:D=1.0:0.3$. Vertex and frons with pale brown bristles; gena and clypeus with pale brown setae; frons with a small concavity at the middle. Antenna clothed with dark brown setae. Tip of lacinia as in Fig. 1A. Mesonotum with pale brown bristles; anterior part of mesoscutum densely with fine pale brown setae. Pro- and metathorax glabrous. First tarsomere of hind leg with 11–14 ctenidiobothria. Forewing Rs and M fused each other for a short distance (Fig. 3A); proportion of Rs: R_{4+5} as 3:2; areola postica flattened. Hindwing setose all around margin except basal quarter of anterior margin; apical half of Rs, entire R_{4+5} and M setose. Paraproct with a field of 10 or 11 trichobothria.

Genitalia (Fig. 4): Each lobe of subgenital plate triangular (Fig. 4B). Gonapophyses as in Fig. 4C–E; external valve weakly convex posteriorly, triangular; apices of dorsal and ventral valves with fringe; apex of ventral valve rounded in lateral aspect.

Dimensions: B 2.50 (2.45–2.50); Fw 2.78 (2.70–2.85); Hw 2.08 (2.00–2.15); f1 0.52 (0.50–0.54); f2 0.35 (0.33–0.37); Hf 0.60 (0.55–0.65); Ht 1.02 (0.98–1.07); t1 0.33 (0.30–0.35); t2 0.11 (0.10–0.12).

Male. Not examined.

Specimens examined. [Ryukyus] 3 females, Naze, Amami-Ōshima Is., Kagoshima Pref., 7. xi. 1962, A. AZIM (ELKU); 2 females, Ōgachi, Amami-Ōshima Is., Kagoshima Pref., 8. xi. 1962, Y. MIYATAKE (ELKU); 8 females, Yona, Okinawajima Is., Okinawa Pref., 10. xi. 1994, K. YOSHIKAWA (YC); [Bonin Isls.] 1 female, Okimura, Hahajima Is., 14. iv. 1993, K. YOSHIKAWA (YC); 1 female, Nakanotaira, Hahajima Is., 18. iv. 1993, K. YOSHIKAWA (YC); 1 female, Nakanotaira, Hahajima Is., 19. iv. 1993, K. YOSHIKAWA (YC).

Habitat. On evergreen broad-leaved trees.

Distribution. Japan (Bonin Isls., Amami-Ōshima Is.*, Okinawajima Is.*), Taiwan*⁴⁾; Pan-tropical.

Pseudocaecilius kagoshimensis (OKAMOTO, 1910), comb. nov.

Kolbea kagoshimensis OKAMOTO, 1910, Ann. Mus. natn. Hung., 8: 200, (type localities: Kagoshima and Moji, Kyushu, Japan); LEE et THORNTON, 1967, Pacific Ins. Monog., 16: 6.

Male. Coloration: Head pale reddish yellow; vertex pale reddish brown; coronal suture brown; eye black, often with reddish tinge; ocelli pale brown with dark blackish brown mesal margins; clypeus pale reddish brown. Antenna

⁴⁾ Taiwan: 1 female, Taihoku [=Taipei], 28. ii. 1947, S. MIYAMOTO (ELKU); 1 female, Taihoku [=Taipei], 4. iii. 1947, S. MIYAMOTO (ELKU).

brown, scape and pedicel darker. Mouth parts pale reddish yellow; molar and teeth areas of mandible brown; maxillary palpus pale yellow. Thorax yellow, usually with brown irregular lateral stripes, which continue to dark areas of posterior part of orbit anteriorly and of 1st abdominal segment posteriorly; markings on thoracic tergites differing by subspecies (Fig. 2B–D). Legs pale yellow; fore tibia and tarsus pale brown; claws black. Forewing (Fig. 8B) hyaline, with a brown marking in each cell along wing margin and at top of areola postica; veins brown, except R, R₁, basal halves of Rs and M, entire CuP and distal end of each veins pale. Hindwing hyaline; veins pale, apical half of Rs, entire R₄₊₅, M and CuA pale brown. Abdomen yellow, 9th abdominal tergum pale brown; apices of hypandrial sclerite and phallosome almost black.

Structure: Eye ratio IO:D=1.1:0.9. Vertex and frons with pale yellow bristles, clypeus densely with pale yellow setae; frons with a small concavity at the middle. Tip of lacinia as in Fig. 2B. Antenna with brown setae. Metanotum with pale brown bristles, anterior part of scutum densely with pale brown fine setae. First tarsomere of hind leg with 13–16 ctenidiobothria. Forewing Rs and M fused with each other for a short distance (Fig. 3B); proportion of Rs:R₄₊₅ as 9:7; areola postica flattened. Hindwing setose all around margin except basal quarter of anterior margin; apical half of Rs, entire R₄₊₅ and M setose; R₁ very short or indistinguishable from C. Last tergum of abdomen with two fields of papillae on hind margin. Epiproct with papillae at apex and median area. Paraproct with a field of 10 or 11 trichobothria.

Genitalia (Fig. 5): Hypandrium differing by subspecies in some structures. Hypandrial lateral sclerite (Fig. 5C, D) narrowing apically; median part of hypandrium desclerotized, and with a pair of small processes on posterior margin mesad to lateral sclerite. Phallosome as in Fig. 5E, F; paramere broad at apex in lateral aspect; aedeagus with some processes as in Fig. 5G.

Female. Coloration: Almost as in male but paler. Markings on thorax differing by subspecies.

Structure: Almost as in male. Eye ratio IO:D=2.0:0.7. Setae of antenna sparser than in male. First tarsomere of hindleg with 12–16 ctenidiobothria. Last tergum and epiproct without papillae. Paraproct with a field of 10 or 11 trichobothria.

Genitalia (Fig. 6): Each lobe of subgenital plate relatively narrow, the plate emarginated deeply between them (Fig. 6B). Gonapophyses (Fig. 6C–E); external valve weakly convex posteriorly, triangular; dorsal valve narrowing and hooked at apex, with another process on dorsal margin near apex; ventral valve without fringe, only with a few fine setae at apex.

Type materials. Three males and one female from Kagoshima and one female from Moji were used for the original description of *Kolbea kagoshimensis*. Assoc. Prof. SUWA of Hokkaido University kindly checked the type materials of

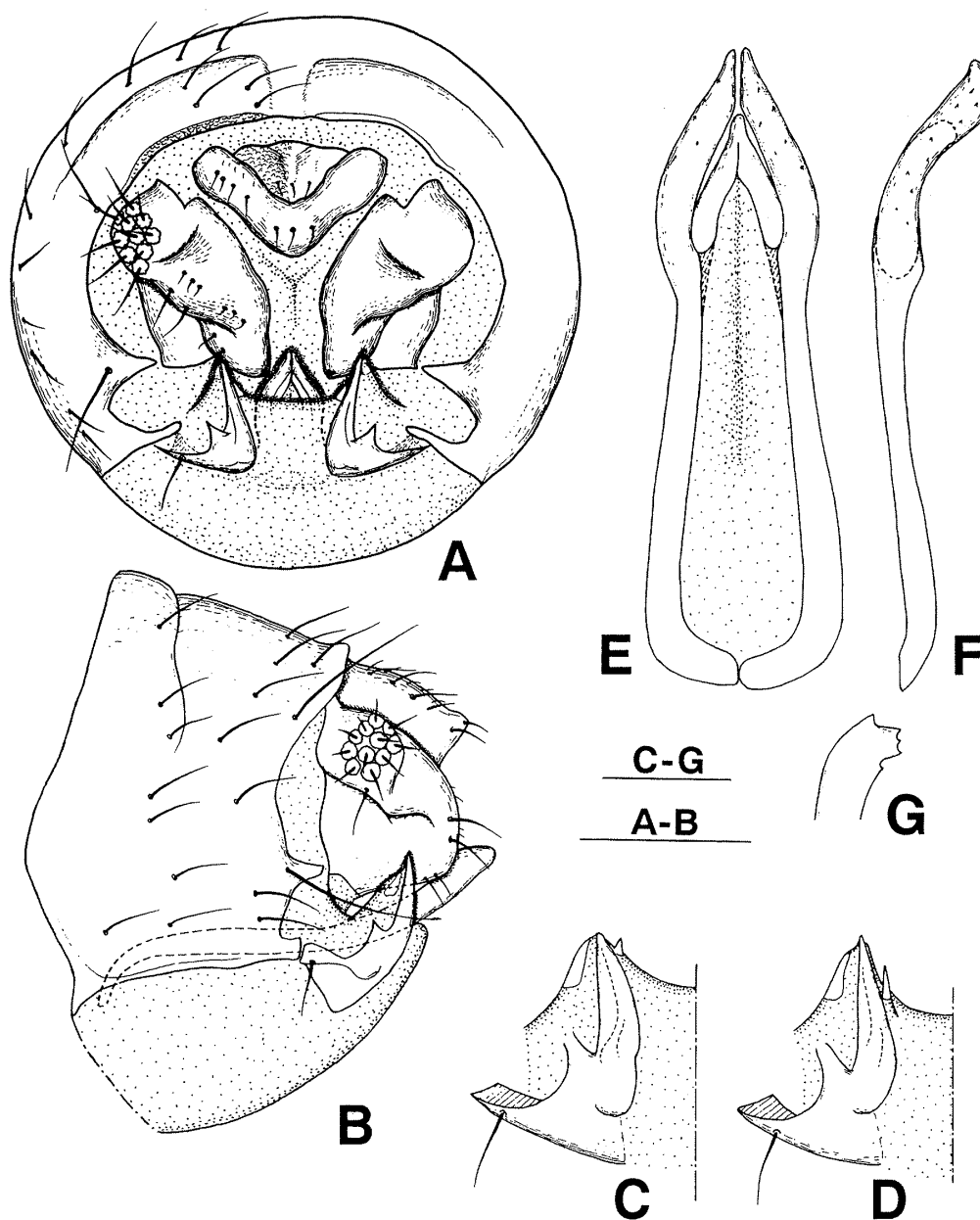


Fig. 5. Male genitalia of *Pseudocaecilius kagoshimensis*. A, terminalia of nominate subspecies, posterior aspect; B, ditto, lateral aspect; C, hypandrium of *P. k. yaeyamensis* subsp. nov., posterior aspect; D, hypandrium of nominate subspecies, posterior aspect; E, phallosome of nominate subspecies, ventral aspect; F, ditto, lateral aspect; G, apex of aedeagus of nominate subspecies, lateral aspect. Scale: 0.2 mm for A and B, 0.1 mm for C-F, 0.05 mm for G.

this species in the collection of Systematic Entomology of the university, and found a male and a female specimens were pinned under the name label of *Kolbea kagoshimensis*. I have examined both the specimens. The female is labeled as "18/6'06/Moji" but the male is unlabeled. The data of the female specimen

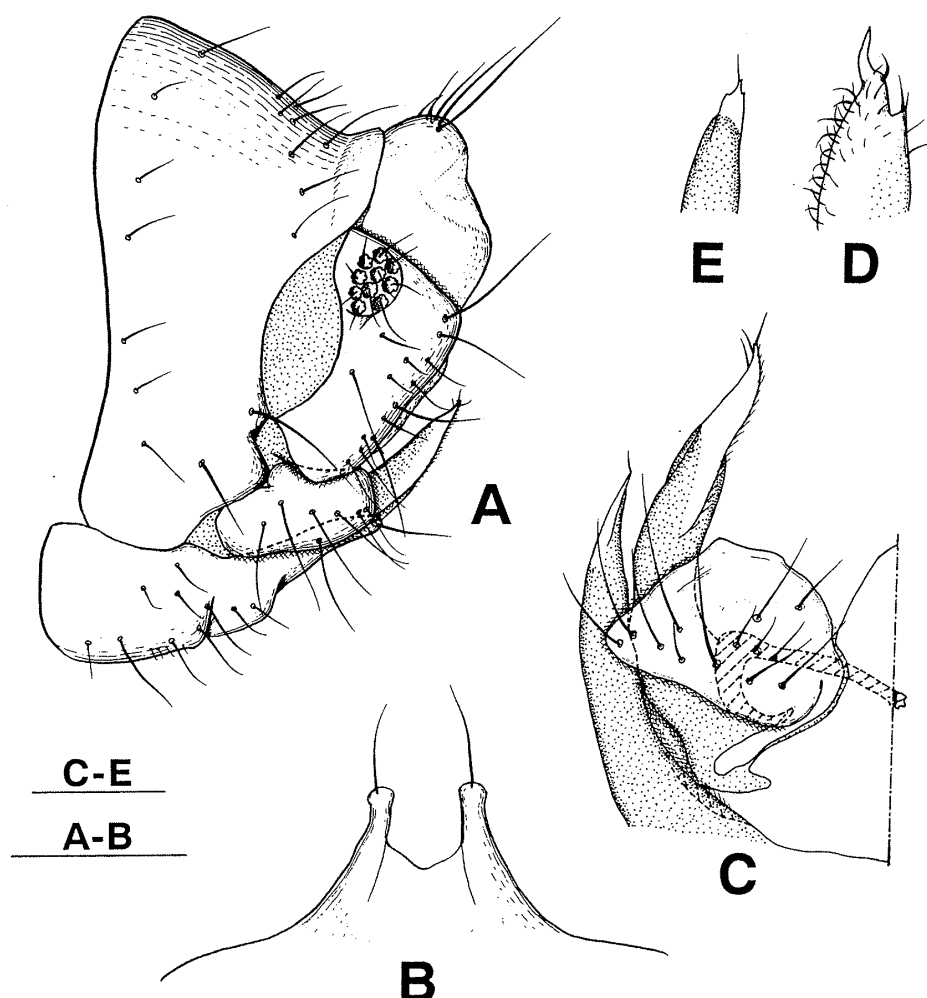


Fig. 6. Female genitalia of *Pseudocaecilius kagoshimensis kagoshimensis*. A, terminalia, lateral aspect; B, subgenital plate, ventral aspect; C, gonapophyses, ventral aspect; D, apex of dorsal valve, lateral aspect; E, apex of ventral valve, lateral aspect. Scale: 0.2 mm for A, 0.1 mm for B, 0.1 mm for C-E.

exactly correspond to those in the original description (18. Juni 1906, S. MATSUMURA). Thus this specimen can be regarded as one of the syntypes. On the other hand, the unlabeled male specimen, which is conspecific with the female specimen, is similarly mounted on a micropin as the female syntype, so that the male is possibly one of the three males from Kagoshima used in the original description.

Some features of the male and the female specimens stated above differ from the original description as follows: Forewing length slightly shorter (2.59 mm in male, 2.91 mm in female; while in the original description 3 mm in male, 3 1/2 mm in female); setae of apical margin of fore- and hindwings crossing; shape of areola postica, coloration of stigmapophysis, and pigmentation of pterostigma and areola postica differ from those of the figure. But all of other features agree

with the original description.

Under this situation, the female specimen from Moji is the most suitable to be designated as the lectotype. But I postpone to designate it as the lectotype by the following reasons. First, a possibility of existence of the type materials from Kagoshima cannot be excluded at present. Secondly, I did not examine any specimens of this species from Kagoshima. If some geographical variations, which can be regarded as subspecific characters, will be found between the populations of Moji and Kagoshima after the lectotype designation of the female syntype from Moji, the subspecific name *kagoshimensis* will be applied to the population of Moji, which is ridiculous etymologically.

Habitat. On evergreen broad-leaved trees and *Kaudelia caudei* (Rhizophoraceae) (in Sumiyô, Amami-Ôshima Is.).

Remarks. This species was originally described by OKAMOTO (1910) as a species of the genus *Kolbea* based only on external structures. However, this species exhibits the shape of lacinia, the forewing venation, crossing setae in the distal margin of the fore- and hindwings and the genital structure which are identical with those of the genus *Pseudocaecilius*. Thus, *kagoshimensis* should better be treated under the genus.

Pseudocaecilius kagoshimensis kagoshimensis (OKAMOTO, 1910)

In this nominotypical subspecies, male thorax (Fig. 2B) with brown markings on lateral lobes of meso- and metascutum and anterior part of anterior mesoscutal lobe, posterior margin of scutellum brown, posterior margin of metanotum black; female thorax (Fig. 2C) usually with faint markings on lateral lobes of meso- and metascutum; male hypandrial lateral sclerite slender and small thorn-like process close to it (Fig. 5D).

Dimensions: *Male.* B 2.13 (2.00–2.32); Fw 2.58 (2.50–2.85); Hw 1.91 (1.80–2.10); f1 0.67 (0.57–0.75); f2 0.49 (0.41–0.65); Hf 0.61 (0.55–0.71); Ht 1.12 (1.05–1.25); t1 0.34 (0.32–0.35); t2 0.11 (0.10–0.12).

Female. B 2.62 (2.30–2.85); Fw 2.96 (2.85–3.05); Hw 2.22 (2.15–2.25); f1 0.61 (0.51–0.67); f2 0.43 (0.38–0.45); Hf 0.61 (0.52–0.67); Ht 1.19 (1.15–1.23); t1 0.37 (0.31–0.41); t2 0.11 (0.10–0.12).

Specimens examined. Syntype female, Moji, 18/6'06 (SEHU); 1 male, locality and date unknown (SEHU); [Kyushu] 1 female, Hirao, Fukuoka C., Fukuoka Pref., 13. vi. 1931, T. ESAKI et. al. (ELKU); 1 female, Mt. Kôrasan, Fukuoka Pref., 3. xi. 1931, K. YASUMATSU (ELKU); 1 female, same locality, 7. viii. 1951, S. MIYAMOTO (ELKU); [Ryukyus] 1 female, Tojômura, Amami-Ôshima Is., Kagoshima Pref., 13. xi. 1962, A. AZIM (ELKU); 1 male 1 female, Mt. Yuwandake, Amami-Ôshima Is., Kagoshima Pref., 28. iii. 1992, K. YOSHIKAWA (YC); 1 female, same locality, 30. iii. 1992, K. YOSHIKAWA; 1 female,

same locality, 30. v. 1993, K. YOSHIZAWA (YC); 1 female, Sumiyô, Amami-Ôshima Is., Kagoshima Pref., 31. iii. 1992, K. YOSHIZAWA (YC); 1 female, same locality, 2. iv. 1992, K. YOSHIZAWA (YC); 1 female, same locality, 29. v. 1993, K. YOSHIZAWA (YC); 1 female, Yona, Okinawajima Is., Okinawa Pref., 20. v. 1993, K. YOSHIZAWA (YC); 1 male 1 female, Mt. Yonahadake, Okinawajima Is., Okinawa Pref., 21. v. 1993, K. YOSHIZAWA (YC); 2 males 2 females, Mt. Terukubiyama, Okinawajima Is., Okinawa Pref., 23. v. 1993, K. YOSHIZAWA (YC); 2 males, Sade, Okinawajima Is., Okinawa Pref., 24. v. 1993, K. YOSHIZAWA (YC); 2 males, Benoki, Okinawajima Is., Okinawa Pref., 25. v. 1993, K. YOSHIZAWA (YC).

Distribution. Japan (Kyushu, Amami-Ôshima Is.*, Okinawajima Is.*).

Remarks. Although I do not dissect the specimens, thoracic coloration that is characteristic in this subspecies can be seen in both the syntype female and the unlabeled male specimen.

Pseudocaecilius kagoshimensis yaeyamensis subsp. nov.

In this subspecies, thorax of both sexes (Fig. 2D) with small brown to light brown markings on lateral lobes of meso- and metascutum and anterior part of anterior mesoscutal lobe, posterior margin of scutellum light brown; male hypandrial lateral sclerite somewhat bold and a small conical process close to it (Fig. 5C).

Dimensions: *Male.* B 2.17 (2.07–2.40); Fw 2.77 (2.70–2.87); Hw 2.07 (2.00–2.13); f1 0.76 (0.73–0.78); f2 0.45 (0.43–0.50); Hf 0.71 (0.67–0.80); Ht 1.18 (1.13–1.23); t1 0.35 (0.33–0.37); t2 0.11 (0.10–0.13).

Female. B 2.56 (1.90–3.00); Fw 2.65 (2.40–2.85); Hw 2.02 (1.80–2.25); f1 0.64 (0.60–0.73); f2 0.41 (0.38–0.50); Hf 0.76 (0.73–0.81); Ht 1.15 (1.10–1.21); t1 0.36 (0.33–0.38); t2 0.12 (0.10–0.13).

Holotype male, Mt. Omotodake, Ishigakijima Is., Okinawa Pref., 17. v. 1993, K. YOSHIZAWA (Type No. 3019, ELKU).

Paratypes: 2 males 5 females, Mt. Bannadake, Ishigakijima Is., Okinawa Pref., 8. v. 1993, K. YOSHIZAWA (YC); 1 female, same locality as for holotype, 9. v. 1993, K. YOSHIZAWA (YC); 3 females, same locality as for holotype, 15. v. 1993, K. YOSHIZAWA (ELKU and YC); 1 male 3 females, same data as for holotype, K. YOSHIZAWA (YC); 1 male 1 female, Kuuera, Ishigakijima Is., Okinawa Pref., 16. v. 1993, K. YOSHIZAWA (YC); 2 males 1 female, Haemita, Iriomotejima Is., Okinawa Pref., 11. v. 1993, K. YOSHIZAWA (YC); 2 males, Monbanare, Iriomotejima Is., Okinawa Pref., 13. v. 1993, K. YOSHIZAWA (YC).

Distribution. Japan (Ishigakijima Is., Iriomotejima Is.).

Pseudocaecilius maculosus ENDERLEIN, 1907

Pseudocaecilius maculosus ENDERLEIN, 1907, Stett. ent. Ztg., 68: 94, (type locality: Kanagawa, Honshu, Japan); OKAMOTO, 1910, Ann. Mus. natn. Hung., 8: 201; LEE et THORNTON, 1967, Pacific Ins. Monog., 16: 112.

Male. Coloration: Head pale brown to pale reddish brown, with a brown band from frons to occiput along coronal suture, and with a brown stripe between orbit and antennal socket; occiput brown; coronal suture dark brown; antennal socket brown, eye black, often with purplish tinge; ocelli pale brown with black mesal margins; clypeus yellowish white. Antenna brown. Mouth parts pale yellowish white; molar and teeth areas of mandible brown; maxillary palpus pale brown. Thorax pale yellowish white with irregular lateral purple stripes, which continue to dark areas of posterior part of orbit anteriorly and of 1st abdominal segment posteriorly; meso- and metanotum (Fig. 2E) pale brown; lateral lobe of meso- and metascutum with a brown marking; anterior lobe of mesoscutum with a pair of brown markings; scutellum brown; postnotum of metanotum brown. Legs pale brown; fore femur brown, its basal 1/4 paler; fore tibia and tarsi brown; claws dark brown. Forewing (Fig. 3C) hyaline, with pale brown markings at apical 1/4 of pterostigma, base of r_1 , basal area of m_3 , basal angle of areola postica and distal angle of cu_1 , and along CuP; veins brown, except R, basal 3/4 of R_1 , basal half of Rs, median part of M, CuA_1 , CuA_2 and A pale brown. Hindwing hyaline; veins pale brown except R + M, apical half of Rs, entire R_{2+3} and R_{4+5} , apical 3/4 of M, and CuA dark brown. Abdomen pale yellowish white; genital segment pale brown; hypandrial sclerite brown.

Structure: Eye ratio IO:D=1.0:1.0. Vertex and frons with dark brown bristles; gena and clypeus with fine yellowish white setae; frons with a small concavity at the middle. Antenna densely clothed with brown setae. Lacinial tip as in Fig. 1C. Mesonotum with dark brown setae; anterior part of scutum densely with minute pale brown setae. Pro- and metathorax glabrous. First tarsomere of hindleg with 13–17 ctenidiobothria. Forewing Rs relatively short, equal in length to R_{4+5} (Fig. 3C); M_{1+2} relatively short, proportion of $M_{1+2}:M_1$ as 2.0:1.3; Rs and M met at a point; areola postica high, nearly of semicircle. Hindwing Rs, R_{2+3} , R_{4+5} , M setose. Last tergum with two wrinkled portions on hind margin. Epiproct with papillae at apex and median area. Paraproct with a field of 10 or 11 trichobothria.

Genitalia (Fig. 7): Hypandrial lateral sclerite (Fig. 7C) slender and pointed at apex, swollen at base; median part of hypandrium weakly sclerotized. Phallosome (Fig. 7D–F); paramere narrowing apically; aedeagus (Fig. 7F) with fine serrated process.

Dimensions: B 2.10 (1.85–2.35); Fw 2.81 (2.50–3.10); Hw 2.15 (2.00–

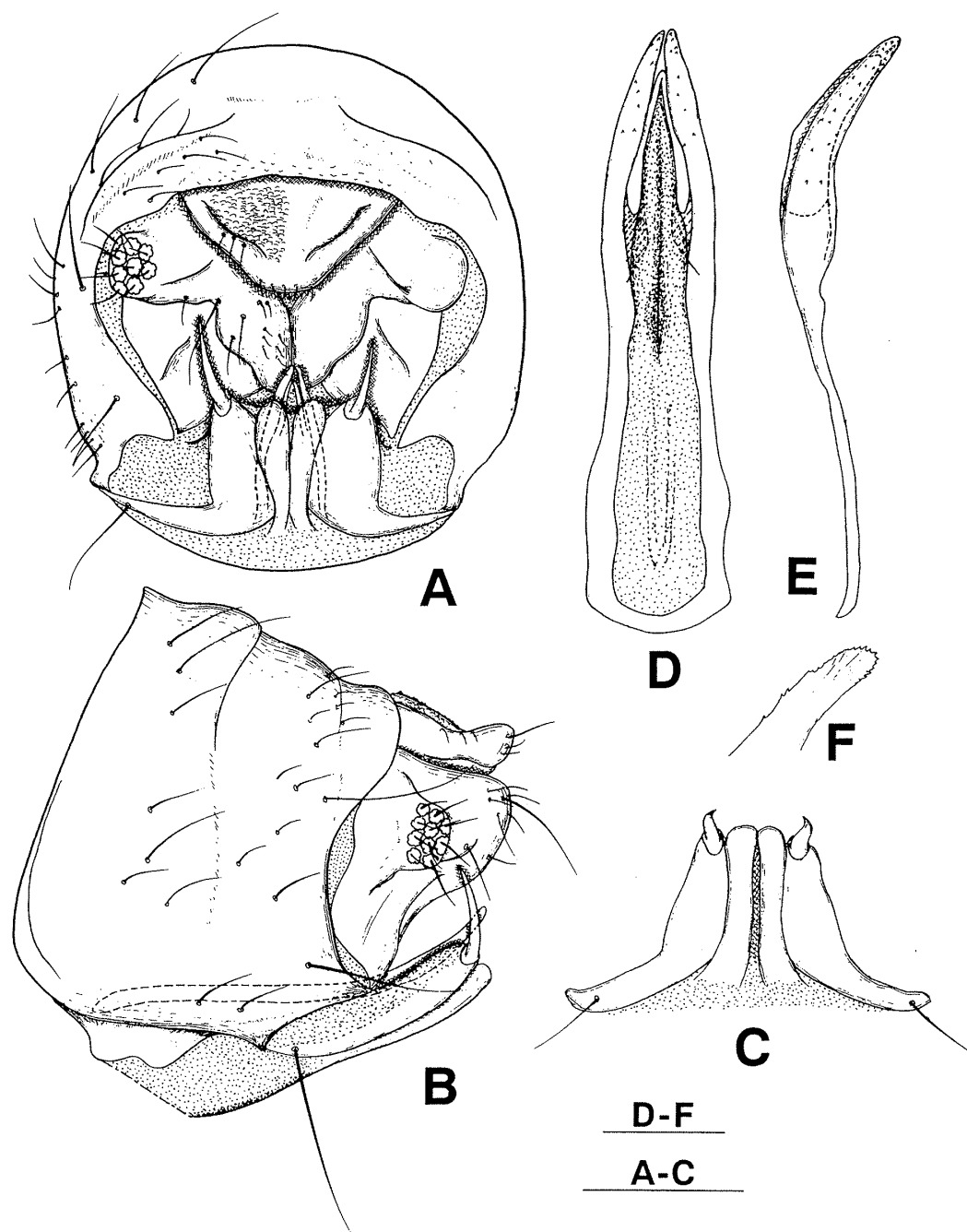


Fig. 7. Male genitalia of *Pseudocaecilius maculosus*. A, terminalia, posterior aspect; B, ditto, lateral aspect; C, hypandrium, ventral aspect; D, phallosome, ventral aspect; E, ditto, lateral aspect; F, aedeagus, lateral aspect. Scale: 0.2 mm for A-C, 0.1 mm for D and E, 0.05 mm for F.

2.40); f1 0.64 (0.60–0.70); f2 0.43 (0.40–0.46); Hf 0.65 (0.60–0.72); Ht 1.09 (1.00–1.20); t1 0.34 (0.31–0.38); t2 0.12 (0.10–0.15).

Female. Coloration: Almost as in male. Antenna pale brown. Foreleg

paler than male. Genital segment yellowish white.

Structure: Almost as in male. Brown setae of antenna sparser than those of male; each seta 1.5 times as long as that of male. Eye ratio $IO:D=1.0:0.4$. First tarsomere of hindleg with 13–15 ctenidiobothria. Last tergum and epiproct without wrinkle or papillae. Paraproct with a field of 10–11 trichobothria.

Genitalia (Fig. 8): Each lobe of subgenital plate broad (Fig. 8B). Gonapophyses (Fig. 8C, D); external valve oval; apices of dorsal and ventral valves slender and pointed; dorsal valve weakly convex dorsally; dorsal and ventral valves without fringe, only with a few fine hairs.

Dimensions: B 2.40 (2.20–2.70); Fw 3.00 (2.80–3.20); Hw 2.20 (2.00–2.50); f1 0.62 (0.56–0.68); f2 0.41 (0.38–0.43); Hf 0.72 (0.68–0.78); Ht 1.09

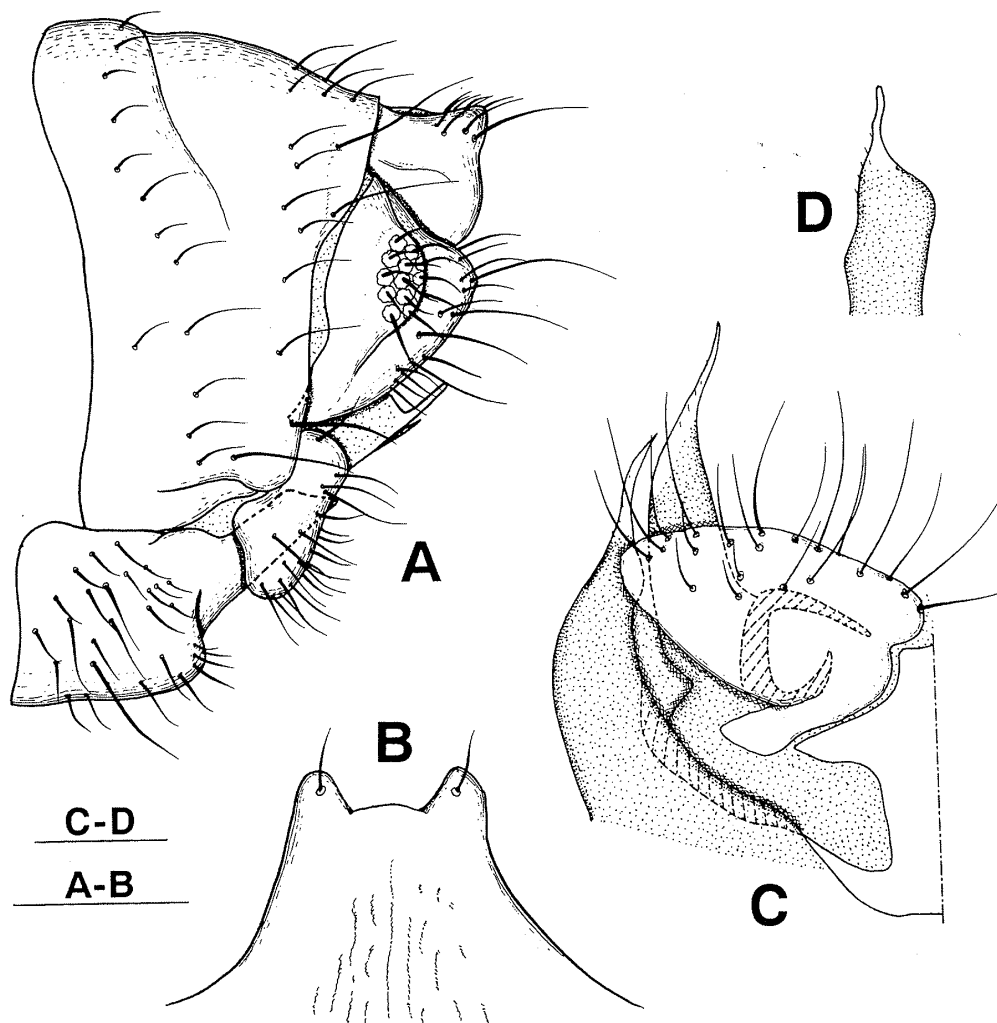


Fig. 8. Female genitalia of *Pseudocaecilius maculosus*. A, terminalia, lateral aspect; B, subgenital plate, ventral aspect; C, gonapophyses, ventral aspect; D, apex of dorsal valve, lateral aspect. Scale: 0.2 mm for A, 0.1 mm for B, 0.1 mm for C–D.

(1.05–1.18); t1 0.33 (0.30–0.37); t2 0.12 (0.10–0.13).

Specimens examined. [Hokkaido] 2 females, Mt. Maruyama, Sapporo C., 25. ix. 1931, IGARASHI (SEHU); [Honshu] 7 males 14 females, Takizawa Vill., Iwate Pref., 24. ix. 1992, S. KAMITANI (YC); 1 female, Mt. Takao, Tokyo Met., 20. viii. 1987, K. KONISHI (NIAES); 1 female, Hirugano, Takawashi Vill., Gifu Pref., 17. vii. 1992, K. YOSHIZAWA (YC); 1 female, Minamiyashiro, Tannanchô, Hyôgo Pref., 4. viii. 1993, Y. NAKATANI (YC); 2 males, Kakezu, Geihoku-chô, Hiroshima Pref., 5. ix. 1992, T. YASUNAGA (YC); 6 males 15 females, Kakezu, Geihoku-chô, Hiroshima Pref., 5. ix. 1992, K. YOSHIZAWA (YC); 12 females, Chôjabara, Geihoku-chô, Hiroshima Pref., 5. ix. 1992, K. YOSHIZAWA (YC); [Kyushu] 1 male, Hirao, Fukuoka C., Fukuoka Pref., 13. vi. 1931, ESAKI et. al. (ELKU); 1 female, Mt. Inunakiyama, Fukuoka Pref., 22. vi. 1994, N. TAKAHASHI (YC); 4 females, Mt. Aburayama, Fukuoka C., 14. xi. 1992, S. MIYAMOTO (YC); 1 female, Ideno-Shiibarutôge, Saga Pref., 25. vi. 1994, N. TAKAHASHI (YC); 2 males, Kamisaka, Tsushima Is., Nagasaki Pref., 23. ix. 1993, K. YOSHIZAWA (YC); 1 female, Mt. Ôboshiyama, Tsushima Is., Nagasaki Pref., 24. ix. 1993, K. YOSHIZAWA (YC); 1 female, Nita, Tsushima Is., Nagasaki Pref., 24. ix. 1993, K. YOSHIZAWA (YC); 1 female, Mt. Taterayama, Tsushima Is., Nagasaki Pref., 25. ix. 1993, K. YOSHIZAWA (YC); 1 female, Mt. Ariakeyama, Tsushima Is., Nagasaki Pref., 26. ix. 1993, K. YOSHIZAWA (YC).

Distribution. Japan (Hokkaido*, Honshu, Kyushu*, Tsushima Is.*); Russian Far East*⁵⁾, Korea*⁶⁾.

Habitat. On evergreen broad-leaved trees and *Pinus densiflora* (Pinaceae) (in Geihoku-chô, Hiroshima Pref.).

Remarks. This species is distinctive in semi-circular areola postica, sclerotized median part of hypandrium and gonapophyses with oval external valve, lobed dorsal valve and unfringed dorsal and ventral valves. The first and third characters are also shown in *Pseudocaecilius* sp. from West Malaysia (LEE and NEW, 1992).

The occurrence of this species in Russian Far East is the northernmost record of the genus.

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⁵⁾ Russian Far East: 3 males, Ussurijskij Zapovednin (west border), Primor'je, 11. vii. 1993, T. YASUNAGA (YC).

⁶⁾ Korea: 3 males 6 females, Kyongju, Kyongsangbuk-Do, 27. viii. 1992, K. YOSHIZAWA (YC).

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New Record of a Non-biting Midge (Diptera, Chironomidae) from Japan

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Key words: Diptera; Chironomidae; Chironominae; *Omisus*; new record.

Through the courtesy of Dr. Mikio HIRABAYASHI (Yamanashi Women's College), I had an opportunity to examine a number of chironomid specimens from Ozegahara of Japan. I could find a species being new to Japan within the specimens.

Omisus caledonicus (EDWARDS, 1932)

Chironomus (Microtendipes) caledonicus EDWARDS, 1932, 47.

Microtendipes caledonicus: PINDER, 1978, 128.

Omisus caledonicus: CRANSTON, DILLON, PINDER & REISS, 1989, 469.

Specimens examined. 74♂♂49♀♀, Ozegahara Gunma Pref., 16. vi. 1994, M. HIRABAYASHI.

Remarks. This species is widely distributed in Europe, and distinguishable from the related species, *Omisus pica* TOWNES, 1945, in having the gonostylus strongly incurved apically (Figs. 1–2).